

# PATENT ABSTRACTS OF JAPAN

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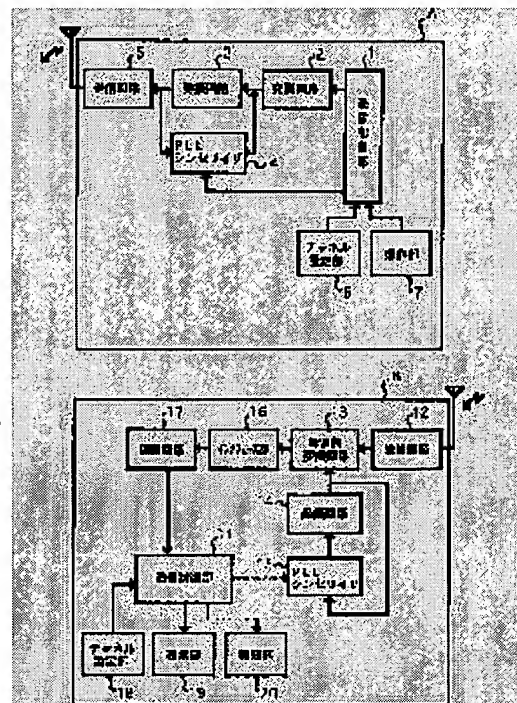
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## (54) RADIO COMMUNICATION SYSTEM AND RADIO RECEIVER

(57)Abstract:

PROBLEM TO BE SOLVED: To transmit a signal from a transmitter to a receiver by selecting a transmission frequency from the transmitter differently in the case of transmission directly to the wireless receiver from the case of transmission via a repeater to the receiver.

SOLUTION: A transmission frequency setting means is configured by an oscillation circuit 3 and a PLL synthesizer 4 of a wireless transmitter A, and a channel setting section 6 selects the transmission frequency equal to a 1st frequency being a reception frequency of a wireless receiver B or a 2nd frequency different from the 1st frequency. Then a relay reception section uses the 2nd frequency as the reception frequency to receive the wireless signal from the wireless transmitter A and a relay transmission section uses the 1st frequency as the transmission frequency to relay the wireless signal received at the wireless receiver B. Upon the receipt of the wireless signal directly from the wireless transmitter A or indirectly via a repeater, the wireless receiver B activates a display section 19 and a notice section 20 according to the wireless signal.



## LEGAL STATUS

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to amelioration of the wireless communication system equipped with the repeater.

[0002]

[Description of the Prior Art] There are some which equipped wireless communication system with the repeater which relays a wireless signal between two or more wireless transmitters and a wireless receiver from the former. Since according to this a repeater can once receive and can transmit the wireless signal transmitted from the wireless transmitter to a wireless receiver, the communication link across which it went broadly is possible.

[0003]

[Problem(s) to be Solved by the Invention] however, in the above-mentioned conventional wireless communication system When the transmission from a wireless transmitter suits two or more coincidence through a repeater, the transmission from the wireless transmitter of the short distance which does not need a repeater The electric wave transmitted to a direct receiver from a transmitter and the electric wave transmitted to a receiver through a repeater from a transmitter will be intermingled, the traffic (traffic) of transmission space will increase, and transmitted electric waves collide. In a wireless receiver, there was a case where all the transmission from a transmitter was unreceivable.

[0004] Moreover, there was nothing that changes two or more frequencies and receives a wireless signal in order to avoid the transmission impossible by an interference etc. in the conventional repeater, and further, in order to avoid this between a repeater and a receiver, what transmits a wireless signal was not developed, changing two or more frequencies. This invention is made in view of the above-mentioned situation, prevents buildup of the traffic of the same frequency electric wave in transmission space by considering as a frequency which is different by the case where the transmit frequencies of a wireless transmitter are not minded with the case where a repeater is minded, and sets it as the 1st object to offer the wireless communication system which could be made to do a communication link certainly.

[0005] In a repeater, the 2nd object is offering the wireless communication system which enabled it to avoid the transmission impossible by the noise or the interference as transmitted a signal to a receiver with two or more frequencies while it is changed to two or more frequencies and receives the signal from a transmitter.

[0006]

[A means for solution to carry out a technical problem] In order to attain the above-mentioned object, in the wireless communication system of this invention according to claim 1 To a wireless transmitter, the transmit frequencies of a wireless signal The 1st same frequency as the received frequency of a wireless receiver, Or a transmit-frequencies setting-out means to set it as either of the 2nd different frequency from this

1st frequency, It has a transmitting means to transmit a wireless signal on the frequency set up with this transmit-frequencies setting-out means. To a repeater A junction receiving means to receive a wireless signal by making the 2nd frequency into received frequency, It considers as the configuration equipped with a junction transmitting means to transmit the 1st frequency for the wireless signal received with this junction receiving means as transmit frequencies. A wireless receiver When a wireless signal is directly received with the same received frequency as the 1st frequency indirectly through a repeater from a wireless transmitter, processing is performed according to this wireless signal. This can protect buildup of the traffic of the same frequency electric wave of transmission space.

[0007] There are a display of the ID number of a transmitter, burning of the indicating lamp corresponding to each message, an alarm output by the voice-told message, etc. in processing performed according to the wireless signal with which a wireless receiver is transmitted here from a wireless transmitter. In wireless communication system according to claim 2 The 1st transmit-frequencies setting-out means which makes sequential selection and sets the transmit frequencies to the wireless signal of one unit to a wireless transmitter out of two or more frequencies, The 2nd transmit-frequencies setting-out means which makes sequential selection and sets up transmit frequencies out of two or more different frequencies from two or more frequencies which the 1st transmit-frequencies setting-out means sets up, The 1st transmit-frequencies setting-out means and a select-transmit-frequency means to choose either of the 2nd transmit-frequencies setting-out means, Either of the 1st and 2nd transmit-frequencies setting-out means which the select-transmit-frequency means chose It has the transmitting means which carries out sequential transmission of the wireless signal on the frequency which carries out sequential change setting out. To a wireless receiver Two or more same frequencies as the frequency in which the 1st transmit-frequencies setting-out means carries out sequential setting out with one which the received frequency setting means which carries out sequential setting out, and this received frequency setting means set as time sharing as received frequency of received frequency It has a receiving means to receive a wireless signal. To a repeater A junction receiving means to carry out sequential setting out at time sharing by making into received frequency two or more same frequencies as the frequency in which the 2nd transmit-frequencies setting-out means carries out sequential setting out, and to receive a wireless signal with one of received frequency, It considers as the configuration equipped with a junction transmitting means to make sequential selection, to change transmit frequencies and to transmit out of two or more same frequencies as the frequency to which the 1st transmit-frequencies setting-out means sets the wireless signal which this junction receiving means received. A wireless receiver performs processing according to this wireless signal, when a receiving means receives a wireless signal indirectly through a repeater directly from a wireless transmitter.

[0008] By this, while being able to prevent buildup of the traffic of the same frequency electric wave of transmission space, when there are the noise and interference of the same frequency as the frequency currently used for a communication link, this can be avoided and a communication link can be ensured. In wireless communication system according to claim 3 In claim 2 to a wireless transmitter The 1st transmit-frequencies setting-out means, It has a transmitting means by which this 1st transmit-frequencies setting-out

means carries out sequential transmission of the wireless signal on the frequency which carries out sequential setting out. The junction receiving means of a repeater The 1st transmit-frequencies setting-out means carries out sequential setting out at time sharing by making into received frequency two or more same frequencies as the frequency which carries out sequential setting out. It considers as the configuration which receives a wireless signal with one of received frequency, and a wireless receiver performs processing according to this wireless signal, when a receiving means receives a wireless signal indirectly through a repeater directly from a wireless transmitter.

[0009] Since according to this the communication link which avoided the noise and the interference can be performed, and two transmission routes are used when the transmission to a receiver from a transmitter is a short distance although the traffic of the same frequency electric wave of transmission space is not different from the former, communicative dependability improves. In wireless communication system according to claim 4, directly [ a wireless receiver ] from a wireless transmitter in claim 3, when a receiving means receives the same wireless signal indirectly through a repeater, processing is performed only according to the wireless signal received previously. Processing by the receiver seems not to overlap by this.

[0010] In wireless communication system according to claim 5, a repeater is equipped with the frequency configuration switch which sets up the received frequency of a junction receiving means, or the transmit frequencies of a junction transmitting means in either of claims 1-3.

[0011]

[Embodiment of the Invention] Below, the gestalt of operation of this invention is explained with a drawing. Drawing 1 and drawing 2 are the block diagrams having shown an example of the internal configuration of the wireless communication system concerning this invention. This wireless communication system consists of repeaters C which relay the wireless signal transmitted to the wireless receiver B from the wireless transmitter A, the wireless receiver B, and the wireless transmitter A.

[0012] The communications control section 1 constituted from a CPU etc. by the wireless transmitter A, and the modulation circuit 2 which modulates the message which transmits to a wireless signal, With the oscillation output from the oscillator circuit 3 to which an oscillation frequency is changed with input voltage, and an oscillator circuit 3 The PLL synthesizer 4 which inputs a frequency control electrical potential difference into an oscillator circuit 3 according to the frequency setting-out data from the communications control section 1, According to the transmit frequencies which an oscillator circuit 3 oscillates, it has the control unit 7 grade which consisted of a switch which instructs signal transmission to be the sending circuit 5 which is a transmitting means to transmit a wireless signal, and the channel setup section 6 which consisted of DIP switches etc., a carbon button, etc.

[0013] In claim 1, the oscillator circuit 3 and the PLL synthesizer 4 constitute the transmit-frequencies setting-out means, and transmit frequencies are set by setting out of the channel setup section 6 to either the 1st same frequency as the received frequency of the wireless receiver B, or the 2nd different frequency from this 1st frequency. To the wireless receiver B, like the wireless transmitter A, subsequently, the communications control section 11, The receiving circuit 12 which is a receiving means to have an oscillator circuit 14, the PLL synthesizer 15, and the channel setup section 18, and to

receive further the wireless signal transmitted from the wireless transmitter A, The frequency changing circuit 13 which changes received frequency into the frequency oscillated from an oscillator circuit 14, The interface section 16 which is needed since an input signal is sent out to a demodulator circuit 17 from this frequency changing circuit 13, It has the demodulator circuit 17 which restores to the received wireless signal, and the display 19 and the information section 20 which consisted of a liquid crystal screen, an annunciator, etc. which operate according to a wireless signal, a loudspeaker, etc.

[0014] At claim 1, the received frequency set up by the frequency changing circuit 13, the oscillator circuit 14, and the PLL synthesizer 15 is being fixed on the 1st frequency. Then, Repeater C is equipped with the frequency configuration switch SW which consisted of the communications control section 30, a junction receive section 40 (junction receiving means) having the function of the wireless receiver B, the junction transmitting section 50 (junction transmitting means) equipped with the function of the wireless transmitter A, and the receiving channel setup section 31 and the send channel setting-out section 32 as shown in drawing 2 . The junction receive section 40 is equipped with a receiving circuit 41, a frequency changing circuit 42, an oscillator circuit 43, the PLL synthesizer 44, the interface section 45, and a demodulator circuit 46, and one junction transmitting section 50 is equipped with a modulation circuit 51, an oscillator circuit 52, the PLL synthesizer 53, and a sending circuit 54 here.

[0015] In addition, in claim 1, by making the 2nd frequency into received frequency, the junction receive section 40 receives a wireless signal from the wireless transmitter A, and the junction transmitting section 50 makes the 1st frequency transmit frequencies, and it is doing junction transmission of the wireless signal received to the wireless receiver B. By such configuration, the wireless receiver B will operate a display 19 and the information section 20 according to this wireless signal, if a wireless signal is directly received indirectly through Repeater C from the wireless transmitter A.

[0016] An example of the channel setup in the channel setup section 6 of the wireless transmitter A, the channel setup section 18 of the wireless receiver B, and the receiving channel setup section 31 and the send channel setting-out section 32 of Repeater C is shown in drawing 3 . Here the example which sets up a channel number (0-7) with a DIP switch is shown, the frequency ( $f_0$ - $f_7$ ) is set to it corresponding to each channel number, and the wireless communication link is performed by making this into transmit frequencies or received frequency.

[0017] In claim 1, the 1st transmit frequencies of the wireless transmitter A, the transmit frequencies of Repeater C, and the received frequency of the wireless receiver B are the same, and it is set up so that the 2nd transmit frequencies of the wireless transmitter A and the received frequency of Repeater C may become the same. An example of the system configuration of wireless communication system according to claim 1 is shown in drawing 4 .

[0018] The system shown here The wireless transmitter A of two or more card systems (ID number1-n) If it consists of the wireless receivers B and Repeaters C which are these \*\*\*\* and either of the control units 7 (manual operation button (A - U)) of the wireless transmitter A is operated A wireless signal is transmitted. This in the carrier beam wireless receiver B A wireless signal can be analyzed, the ID number of the wireless transmitter A which performed button grabbing to transmitter number display 19a of a display 19 can be displayed, and manual operation button annunciator 19b prepared

corresponding to each manual operation button (A - U) can be turned on or blinked.

[0019] Moreover, by setting out of the channel setup section 6, transmission of the wireless transmitter A can change the transmit frequencies of Transmitter A, and the case from a long distance can also relay a wireless signal with Repeater C. In carrying out the communication link which minded [ A ] Repeater C for a channel number "1" and transmit frequencies f1 when the communication link which does not mind Repeater C was carried out, while showing the case where a channel number "2" and transmit frequencies f2 are set up (refer to drawing 3 ), the example of the receiver B when operating manual operation button (a) of the wireless transmitter A whose ID number is "1" of operation is shown in this drawing. In addition, f1, and the received frequency and transmit frequencies of Repeater C of the received frequency of the wireless receiver B at this time are f2 and f1, respectively.

[0020] Then, the timing diagram shows basic actuation of this wireless communication system to (a) - (f) of drawing 5 . Here, the case where it transmits from the transmitter (a) which has set transmit frequencies as the 1st frequency (f1) in order to communicate without minding Repeater C, and the transmitter (b) which has set transmit frequencies as the 2nd frequency (f2) in order to communicate through Repeater C is shown. It is received by Repeater C, and a frequency is changed into the wireless signal transmitted on the frequency f2 by f1, and it is transmitted to the wireless receiver B as illustrated.

[0021] Next, wireless communication system according to claim 2 is explained. The 1st transmit-frequencies setting-out means which makes sequential selection and sets the transmit frequencies to the wireless signal of one unit to the wireless transmitter A out of two or more frequencies in claim 2, The 2nd transmit-frequencies setting-out means which makes sequential selection and sets up transmit frequencies out of two or more different frequencies from two or more frequencies which this 1st transmit-frequencies setting-out means sets up, Although it has the 1st transmit-frequencies setting-out means and a select-transmit-frequency means to choose either of the 2nd transmit-frequencies setting-out means These set up a channel number in the channel setup section 6, are making into transmit frequencies the frequency by which the multi-statement's is beforehand carried out to the channel number one by one, and can realize it.

[0022] Moreover, in the wireless receiver B, the received frequency (it is the same as the frequency which the 1st transmit-frequencies setting-out means sets up) by which sequential setting out is carried out, and the received frequency (it is the same as the frequency which the 2nd transmit-frequencies setting-out means sets up) of the junction receive section 40 set up in Repeater C and the transmit frequencies (it is the same as the frequency which the 1st transmit-frequencies setting-out means sets up) of the junction transmitting section 50 can also be similarly set as time sharing corresponding to a channel number.

[0023] The timing diagram shows basic actuation of this wireless communication system to (a) - (g) of drawing 6 . In order to communicate through the transmitter (a) which changed two transmit frequencies (f1, f9) by turns, and has set them up here with the 1st transmit-frequencies setting-out means in order to communicate without minding Repeater C, and Repeater C The case where transmission is carried out by the transmitter (b) which changed two transmit frequencies (f2, f10) by turns, and has set them up with the 2nd transmit-frequencies setting-out means is shown.

[0024] In the wireless receiver B, two received frequency (f1, f9) is changed by time

sharing. In Repeater C Since two received frequency ( $f_2$ ,  $f_{10}$ ) is changed by time sharing, Even if the noise or interference which is the same frequency as transmit frequencies as shown in (g), or received frequency is transmitted, in Receiver B and Repeater C The wireless signal from Transmitter A is detected, received frequency can be fixed, a signal can be received, and the signal further received to Receiver B can be transmitted in Repeater C.

[0025] Next, wireless communication system according to claim 3 is explained. In claim 3, the wireless transmitter A in claim 2 performs sequential transmission only with the transmit frequencies by the 1st transmit-frequencies setting-out means, and the junction receive section 40 of Repeater C does sequential setting out of the frequency same with received frequency as the received frequency (frequency by the 1st transmit-frequencies setting-out means) of the wireless receiver B at time sharing. That is, if it is transmission of the wireless transmitter A from a short distance, the same signal will be received with both Receiver B and the repeater C.

[0026] The timing diagram shows basic actuation of this wireless communication system to (a) - (g) of drawing 7 . With the 1st transmit-frequencies setting-out means, here, two transmit frequencies ( $f_1$ ,  $f_9$ ) are changed by turns, and are set to it, and the case of the transmitter (a) transmitted from a short distance and the transmitter (b) transmitted from a long distance is shown.

[0027] With the wireless receiver B and Repeater C, even when the noise or interference which is the same frequency as either transmit frequencies and received frequency is transmitted as shown in (g) since two received frequency ( $f_1$ ,  $f_9$ ) is changed one by one by time sharing, the wireless signal from Transmitter A can be received and the signal further received to Receiver B can be transmitted with Repeater C.

[0028] In addition, if it is transmission (a) from a short distance in this case, while Receiver B receives a signal directly from Transmitter A, it will receive through Repeater C. What is necessary is to let only the wireless signal previously received in predetermined time be a processing object in Receiver B, when you receive the wireless signal same in this way.

[0029]

[Effect of the Invention] According to the wireless communication system of this invention according to claim 1, so that he can understand also from the above explanation in a wireless transmitter By the case where transmit frequencies are transmitted to a direct wireless receiver, and the case where a repeater is minded since traffic of the same frequency can be lessened, if the repeater also sets up received frequency and the transmit frequencies to a wireless transmitter corresponding to this, since it is made to differ and can come out and set up The traffic of transmission space increases like before, there is no case where a communication link becomes impossible, and the signal from a transmitter can be certainly transmitted to a receiver.

[0030] Since the transmit frequencies of a wireless transmitter, the received frequency of a wireless receiver, and the received frequency and transmit frequencies of a repeater are changed one by one according to wireless communication system according to claim 2 . Even if the noise and interference of the same frequency as the frequency currently used for a communication link occur, while avoiding this and being able to perform a positive communication link Since the frequency between a transmitter and a repeater, and the frequency transmitted to a direct receiver from a transmitter and the frequency between a

repeater and a receiver are changed among these frequencies, buildup of the traffic of transmission space can also be prevented.

[0031] Since two or more same frequencies are used for the frequency when transmitting to a direct receiver from a transmitter, the frequency between a transmitter and a repeater, and the frequency between a repeater and a receiver according to wireless communication system according to claim 3, while the transmission impossible by the noise or the interference is avoidable, when the transmission to a receiver from a transmitter is a short distance, communicative dependability can be raised by using two transmission routes.

[0032] It seems that it does not overlap and process in a receiver since only the wireless signal received previously is confirmed when the wireless signal which the wireless receiver received directly from the wireless transmitter, and the signal received through the repeater are the same according to wireless communication system according to claim 4. Since it has the frequency configuration switch which sets the received frequency from a wireless transmitter, and the transmit frequencies to a wireless receiver to a repeater so that it may correspond to a communications partner according to wireless communication system according to claim 5, a frequency configuration switch can be set up so that two paths, the path which carries out direct communication between a transmitter and a receiver when there is little traffic, and the path through a repeater, can be used, and communicative dependability can be raised. Moreover, if traffic increases to reverse, received frequency can be changed into it so that the transmitter made applicable to receiving may be limited only to what has a required repeater.

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## TECHNICAL FIELD

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[Field of the Invention] This invention relates to amelioration of the wireless communication system equipped with the repeater.

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## PRIOR ART

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[Description of the Prior Art] There are some which equipped wireless communication system with the repeater which relays a wireless signal between two or more wireless transmitters and a wireless receiver from the former. Since according to this a repeater can once receive and can transmit the wireless signal transmitted from the wireless transmitter to a wireless receiver, the communication link across which it went broadly is possible.

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## EFFECT OF THE INVENTION

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[Effect of the Invention] According to [ so that he can understand also from the above explanation ] the wireless communication system of this invention according to claim 1,

it is with a wireless transmitter, since it is made to differ and can come out and set up by the case where transmit frequencies are transmitted to a direct wireless receiver, and the case where a repeater is minded, if the repeater also sets up received frequency and the transmit frequencies to a wireless transmitter corresponding to this, since traffic of the same frequency can be lessened, the traffic of transmission space increases like before, there is no case where a communication link becomes impossible, and the signal from a transmitter can be certainly transmitted to a receiver.

[0030] Since the transmit frequencies of a wireless transmitter, the received frequency of a wireless receiver, and the received frequency and transmit frequencies of a repeater are changed one by one according to wireless communication system according to claim 2, Since the frequency between a transmitter and a repeater, and the frequency transmitted to a direct receiver from a transmitter and the frequency between a repeater and a receiver are changed among these frequencies while avoiding this and being able to perform a positive communication link, even if the noise and interference of the same frequency as the frequency currently used for a communication link occur, buildup of the traffic of transmission space can also be prevented.

[0031] Since two or more same frequencies are used for the frequency when transmitting to a direct receiver from a transmitter, the frequency between a transmitter and a repeater, and the frequency between a repeater and a receiver according to wireless communication system according to claim 3, while the transmission impossible by the noise or the interference is avoidable, when the transmission to a receiver from a transmitter is a short distance, communicative dependability can be raised by using two transmission routes.

[0032] It seems that it does not overlap and process in a receiver since only the wireless signal received previously is confirmed when the wireless signal which the wireless receiver received directly from the wireless transmitter, and the signal received through the repeater are the same according to wireless communication system according to claim 4. Since it has the frequency configuration switch which sets the received frequency from a wireless transmitter, and the transmit frequencies to a wireless receiver to a repeater so that it may correspond to a communications partner according to wireless communication system according to claim 5, a frequency configuration switch can be set up so that two paths, the path which carries out direct communication between a transmitter and a receiver when there is little traffic, and the path through a repeater, can be used, and communicative dependability can be raised. Moreover, if traffic increases to reverse, received frequency can be changed into it so that the transmitter made applicable to receiving may be limited only to what has a required repeater.

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] however, in the above-mentioned conventional wireless communication system When the transmission from a wireless transmitter suits two or more coincidence through a repeater, the transmission from the wireless transmitter of the short distance which does not need a repeater The electric wave transmitted to a direct receiver from a transmitter and the electric wave transmitted to a receiver through a repeater from a transmitter will be intermingled, the traffic

(traffic) of transmission space will increase, and transmitted electric waves collide. In a wireless receiver, there was a case where all the transmission from a transmitter was unreceivable.

[0004] Moreover, there was nothing that changes two or more frequencies and receives a wireless signal in order to avoid the transmission impossible by an interference etc. in the conventional repeater, and further, in order to avoid this between a repeater and a receiver, what transmits a wireless signal was not developed, changing two or more frequencies. This invention is made in view of the above-mentioned situation, prevents buildup of the traffic of the same frequency electric wave in transmission space by considering as a frequency which is different by the case where the transmit frequencies of a wireless transmitter are not minded with the case where a repeater is minded, and sets it as the 1st object to offer the wireless communication system which could be made to do a communication link certainly.

[0005] In a repeater, the 2nd object is offering the wireless communication system which enabled it to avoid the transmission impossible by the noise or the interference as transmitted a signal to a receiver with two or more frequencies while it is changed to two or more frequencies and receives the signal from a transmitter

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## MEANS

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[A means for solution to carry out a technical problem] In order to attain the above-mentioned object, in the wireless communication system of this invention according to claim 1 To a wireless transmitter, the transmit frequencies of a wireless signal The 1st same frequency as the received frequency of a wireless receiver, Or a transmit-frequencies setting-out means to set it as either of the 2nd different frequency from this 1st frequency, It has a transmitting means to transmit a wireless signal on the frequency set up with this transmit-frequencies setting-out means. To a repeater A junction receiving means to receive a wireless signal by making the 2nd frequency into received frequency, It considers as the configuration equipped with a junction transmitting means to transmit the 1st frequency for the wireless signal received with this junction receiving means as transmit frequencies. A wireless receiver When a wireless signal is directly received with the same received frequency as the 1st frequency indirectly through a repeater from a wireless transmitter, processing is performed according to this wireless signal. This can protect buildup of the traffic of the same frequency electric wave of transmission space.

[0007] There are a display of the ID number of a transmitter, burning of the indicating lamp corresponding to each message, an alarm output by the voice-told message, etc. in processing performed according to the wireless signal with which a wireless receiver is transmitted here from a wireless transmitter. In wireless communication system according to claim 2 The 1st transmit-frequencies setting-out means which makes sequential selection and sets the transmit frequencies to the wireless signal of one unit to a wireless transmitter out of two or more frequencies, The 2nd transmit-frequencies setting-out means which makes sequential selection and sets up transmit frequencies out of two or more different frequencies from two or more frequencies which the 1st transmit-frequencies setting-out means sets up, The 1st transmit-frequencies setting-out

means and a select-transmit-frequency means to choose either of the 2nd transmit-frequencies setting-out means, Either of the 1st and 2nd transmit-frequencies setting-out means which the select-transmit-frequency means chose It has the transmitting means which carries out sequential transmission of the wireless signal on the frequency which carries out sequential change setting out. To a wireless receiver Two or more same frequencies as the frequency in which the 1st transmit-frequencies setting-out means carries out sequential setting out with one which the received frequency setting means which carries out sequential setting out, and this received frequency setting means set as time sharing as received frequency of received frequency It has a receiving means to receive a wireless signal. To a repeater A junction receiving means to carry out sequential setting out at time sharing by making into received frequency two or more same frequencies as the frequency in which the 2nd transmit-frequencies setting-out means carries out sequential setting out, and to receive a wireless signal with one of received frequency, It considers as the configuration equipped with a junction transmitting means to make sequential selection, to change transmit frequencies and to transmit out of two or more same frequencies as the frequency to which the 1st transmit-frequencies setting-out means sets the wireless signal which this junction receiving means received. A wireless receiver performs processing according to this wireless signal, when a receiving means receives a wireless signal indirectly through a repeater directly from a wireless transmitter.

[0008] By this, while being able to prevent buildup of the traffic of the same frequency electric wave of transmission space, when there are the noise and interference of the same frequency as the frequency currently used for a communication link, this can be avoided and a communication link can be ensured. In wireless communication system according to claim 3 In claim 2 to a wireless transmitter The 1st transmit-frequencies setting-out means, It has a transmitting means by which this 1st transmit-frequencies setting-out means carries out sequential transmission of the wireless signal on the frequency which carries out sequential setting out. The junction receiving means of a repeater The 1st transmit-frequencies setting-out means carries out sequential setting out at time sharing by making into received frequency two or more same frequencies as the frequency which carries out sequential setting out. It considers as the configuration which receives a wireless signal with one of received frequency, and a wireless receiver performs processing according to this wireless signal, when a receiving means receives a wireless signal indirectly through a repeater directly from a wireless transmitter.

[0009] Since according to this the communication link which avoided the noise and the interference can be performed, and two transmission routes are used when the transmission to a receiver from a transmitter is a short distance although the traffic of the same frequency electric wave of transmission space is not different from the former, communicative dependability improves. In wireless communication system according to claim 4, directly [ a wireless receiver ] from a wireless transmitter in claim 3, when a receiving means receives the same wireless signal indirectly through a repeater, processing is performed only according to the wireless signal received previously. Processing by the receiver seems not to overlap by this.

[0010] In wireless communication system according to claim 5, a repeater is equipped with the frequency configuration switch which sets up the received frequency of a junction receiving means, or the transmit frequencies of a junction transmitting means in

either of claims 1-3.

[0011]

[Embodiment of the Invention] Below, the gestalt of operation of this invention is explained with a drawing. Drawing 1 and drawing 2 are the block diagrams having shown an example of the internal configuration of the wireless communication system concerning this invention. This wireless communication system consists of repeaters C which relay the wireless signal transmitted to the wireless receiver B from the wireless transmitter A, the wireless receiver B, and the wireless transmitter A.

[0012] The communications control section 1 constituted from a CPU etc. by the wireless transmitter A, and the modulation circuit 2 which modulates the message which transmits to a wireless signal, With the oscillation output from the oscillator circuit 3 to which an oscillation frequency is changed with input voltage, and an oscillator circuit 3 The PLL synthesizer 4 which inputs a frequency control electrical potential difference into an oscillator circuit 3 according to the frequency setting-out data from the communications control section 1, According to the transmit frequencies which an oscillator circuit 3 oscillates, it has the control unit 7 grade which consisted of a switch which instructs signal transmission to be the sending circuit 5 which is a transmitting means to transmit a wireless signal, and the channel setup section 6 which consisted of DIP switches etc., a carbon button, etc.

[0013] In claim 1, the oscillator circuit 3 and the PLL synthesizer 4 constitute the transmit-frequencies setting-out means, and transmit frequencies are set by setting out of the channel setup section 6 to either the 1st same frequency as the received frequency of the wireless receiver B, or the 2nd different frequency from this 1st frequency. To the wireless receiver B, like the wireless transmitter A, subsequently, the communications control section 11, The receiving circuit 12 which is a receiving means to have an oscillator circuit 14, the PLL synthesizer 15, and the channel setup section 18, and to receive further the wireless signal transmitted from the wireless transmitter A, The frequency changing circuit 13 which changes received frequency into the frequency oscillated from an oscillator circuit 14, The interface section 16 which is needed since an input signal is sent out to a demodulator circuit 17 from this frequency changing circuit 13, It has the demodulator circuit 17 which restores to the received wireless signal, and the display 19 and the information section 20 which consisted of a liquid crystal screen, an annunciator, etc. which operate according to a wireless signal, a loudspeaker, etc.

[0014] At claim 1, the received frequency set up by the frequency changing circuit 13, the oscillator circuit 14, and the PLL synthesizer 15 is being fixed on the 1st frequency. Then, the junction receive section 40 which equipped Repeater C with the communications control section 30 and the function of the wireless receiver B as shown in drawing 2

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing an example of the internal configuration of the wireless communication system concerning this invention (a wireless transmitter and

wireless receiver).

[Drawing 2] It is the block diagram showing an example of the internal configuration of the wireless communication system concerning this invention (repeater).

[Drawing 3] It is drawing showing an example of channel setup (frequency setting).

[Drawing 4] It is drawing showing an example of the system configuration of the wireless communication system concerning this invention.

[Drawing 5] (a) - (f) is a timing diagram which shows an example of basic actuation of the wireless communication system of this invention according to claim 1.

[Drawing 6] (a) - (g) is a timing diagram which shows an example of basic actuation of the wireless communication system of this invention according to claim 2.

[Drawing 7] (a) - (g) is a timing diagram which shows an example of basic actuation of the wireless communication system of this invention according to claim 3.

[Description of Notations]

A ... Wireless transmitter

1 ... Communications control section

3 ... Oscillator circuit

5 ... Sending circuit

6 ... Channel setup section

7 ... Control unit

B ... Wireless receiver

11 ... Communications control section

12 ... Receiving circuit

13 ... Frequency changing circuit

14 ... Oscillator circuit

18 ... Channel setup section

19 ... Display

20 ... Information section

C ... Repeater

30 ... Communications control section

SW ... Frequency configuration switch

31 ... Receiving channel setup section

32 ... Send channel setting-out section

40 ... Junction receive section

50 ... Junction transmitting section

f0-f7 ... Frequency









\* NOTICES \*

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

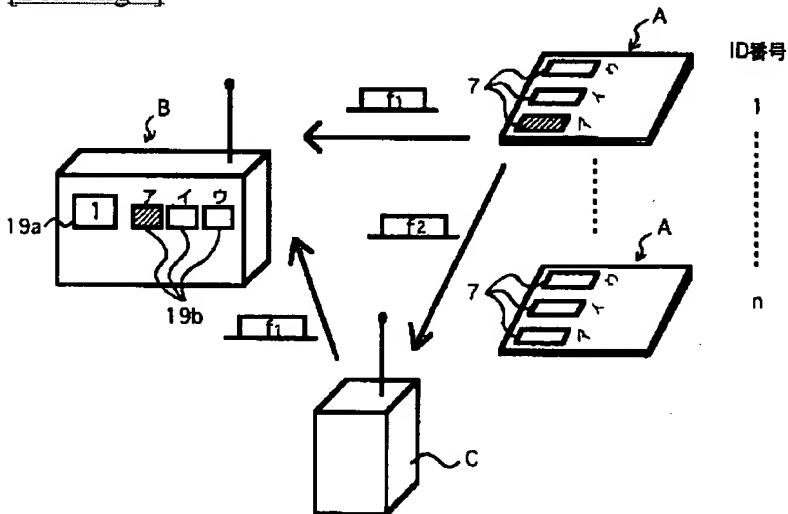
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

## DRAWINGS

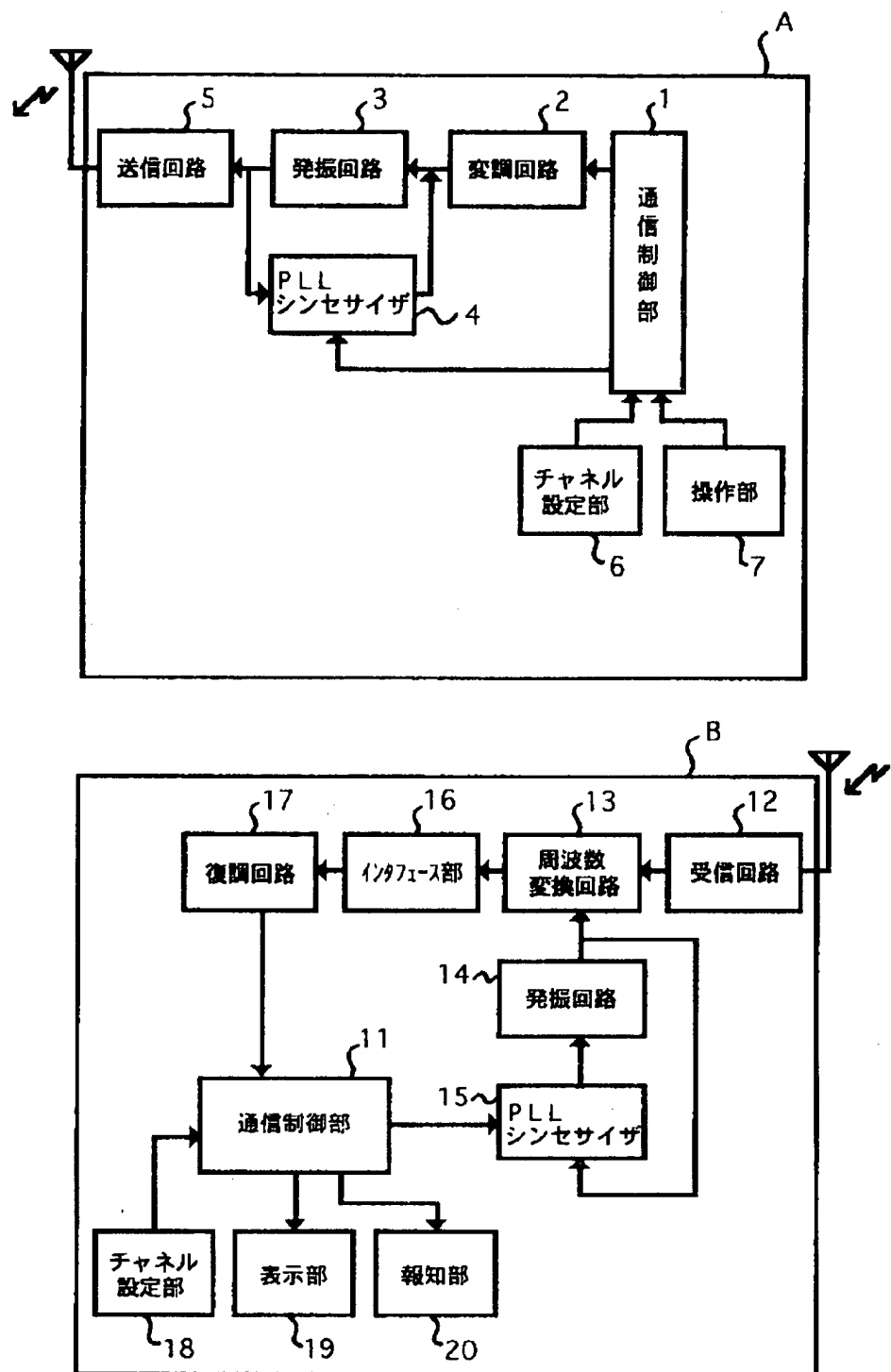
[Drawing 3]

チャネル番号	ディップスイッチ	周波数
0		f <sub>0</sub>
1		f <sub>1</sub>
2		f <sub>2</sub>
3		f <sub>3</sub>
4		f <sub>4</sub>
5		f <sub>5</sub>
6		f <sub>6</sub>
7		f <sub>7</sub>

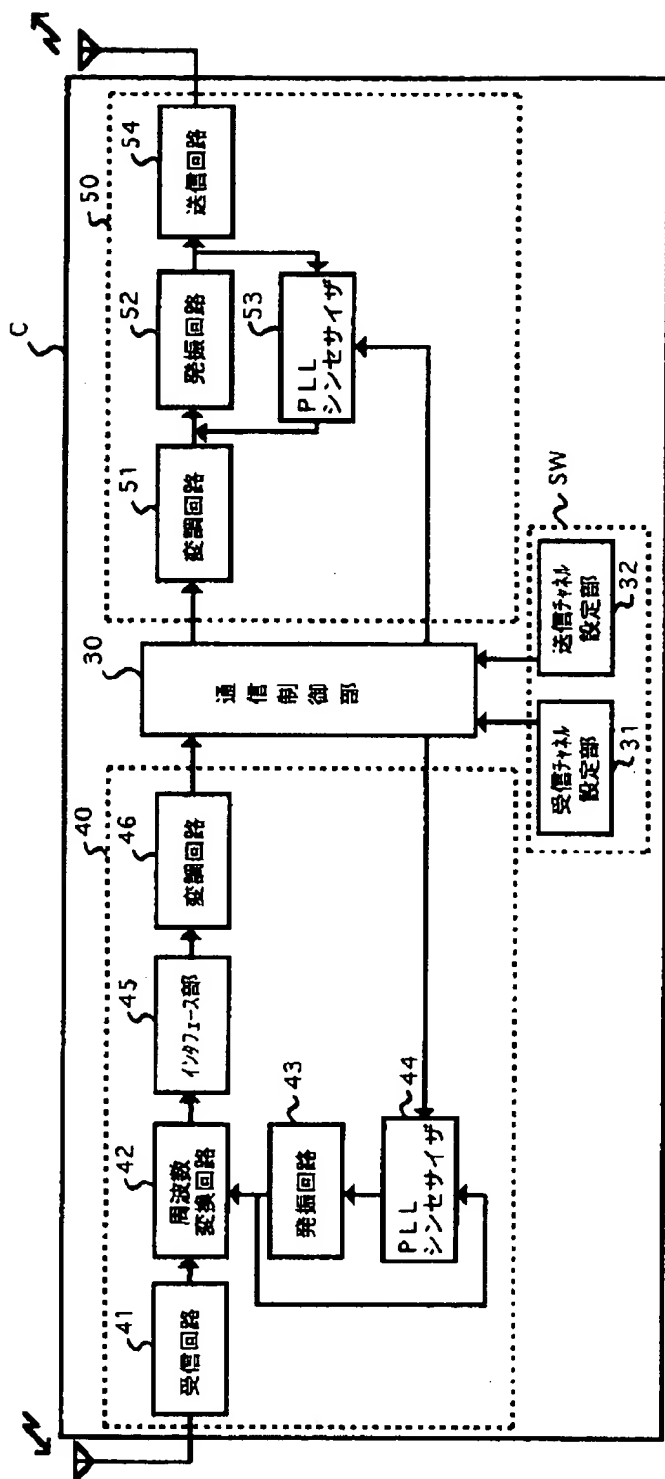
[Drawing 4]



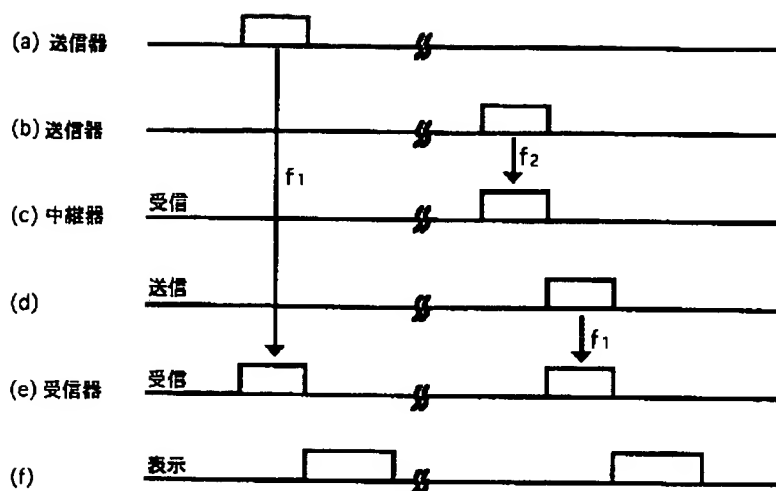
[Drawing 1]



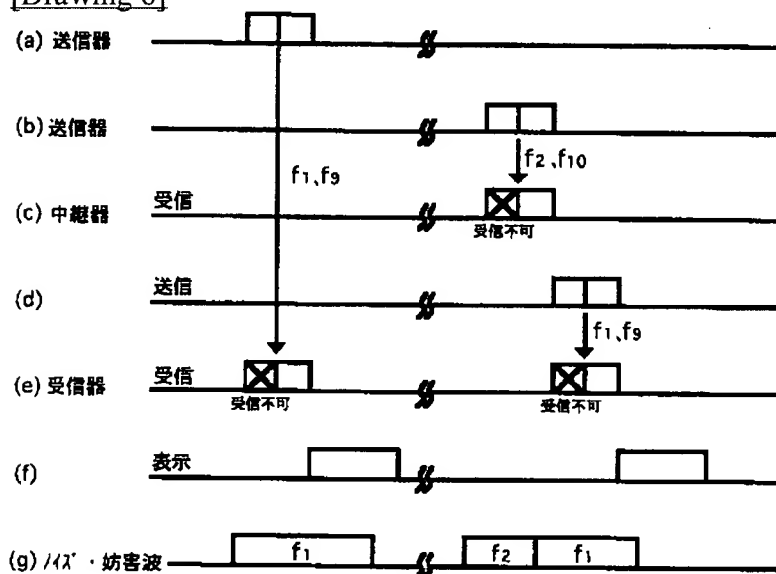
[Drawing 2]



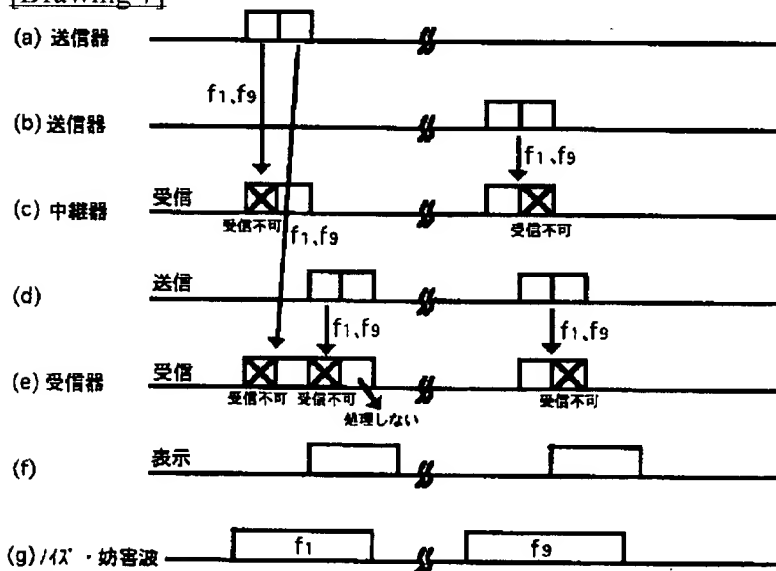
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]

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## CLAIMS

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### [Claim(s)]

[Claim 1] In the wireless communication system which consisted of a wireless transmitter, a wireless receiver, and a repeater that relays the wireless signal transmitted to a wireless receiver from these wireless transmitter In the above-mentioned wireless transmitter, the transmit frequencies of a wireless signal The 1st same frequency as the received frequency of the above-mentioned wireless receiver, Or a transmit-frequencies setting-out means to set it as either of the 2nd different frequency from this 1st frequency, It has a transmitting means to transmit a wireless signal on the frequency set up with this transmit-frequencies setting-out means. To the above-mentioned repeater A junction receiving means to receive a wireless signal by making the 2nd frequency of the above into received frequency, It considers as the configuration equipped with a junction transmitting means to transmit the 1st frequency of the above for the wireless signal received with this junction receiving means as transmit frequencies. The above-mentioned wireless receiver Wireless communication system characterized by performing processing according to this wireless signal when a wireless signal is directly received with the same received frequency as the 1st frequency of the above indirectly through the above-mentioned repeater from the above-mentioned wireless transmitter.

[Claim 2] In claim 1 to the above-mentioned wireless transmitter The 1st transmit-frequencies setting-out means which makes sequential selection and sets up the transmit frequencies to the wireless signal of one unit out of two or more frequencies, The 2nd transmit-frequencies setting-out means which makes sequential selection and sets up transmit frequencies out of two or more different frequencies from two or more frequencies which the transmit-frequencies setting-out means of the above 1st sets up, The transmit-frequencies setting-out means of the above 1st, and a select-transmit-frequency means to choose either of the 2nd transmit-frequencies setting-out means, Either of the 1st and 2nd transmit-frequencies setting-out means which the above-mentioned select-transmit-frequency means chose It has the transmitting means which carries out sequential transmission of the wireless signal on the frequency which carries out sequential change setting out. To the above-mentioned wireless receiver Two or more same frequencies as the frequency in which the transmit-frequencies setting-out means of the above 1st carries out sequential setting out with one which the received frequency setting means which carries out sequential setting out, and this received frequency setting means set as time sharing as received frequency of received frequency It has a receiving means to receive a wireless signal. To the above-mentioned repeater A junction receiving means to carry out sequential setting out at time sharing by making into received frequency two or more same frequencies as the frequency in which the transmit-frequencies setting-out means of the above 2nd carries out sequential setting out, and to receive a wireless signal with one of received frequency, It considers as the configuration equipped with a junction transmitting means to make sequential selection, to change transmit frequencies and to transmit out of two or more same frequencies as the frequency to which the transmit-frequencies setting-out means of the above 1st sets the wireless signal which this junction receiving means received. The above-mentioned wireless receiver is wireless communication system characterized by performing

processing according to this wireless signal when the above-mentioned receiving means receives a wireless signal indirectly through the above-mentioned repeater directly from the above-mentioned wireless transmitter.

[Claim 3] In claim 2 to the above-mentioned wireless transmitter It has the transmit-frequencies setting-out means of the above 1st, and a transmitting means by which this 1st transmit-frequencies setting-out means carries out sequential transmission of the wireless signal on the frequency which carries out sequential setting out. The junction receiving means of the above-mentioned repeater The transmit-frequencies setting-out means of the above 1st carries out sequential setting out at time sharing by making into received frequency two or more same frequencies as the frequency which carries out sequential setting out. It considers as the configuration which receives a wireless signal with one of received frequency. The above-mentioned wireless receiver from the above-mentioned wireless transmitter directly Or wireless communication system characterized by performing processing according to this wireless signal when the above-mentioned receiving means receives a wireless signal indirectly through the above-mentioned repeater.

[Claim 4] It is the wireless communication system characterized by performing processing only according to the wireless signal received previously when the above-mentioned wireless receiver receives the same wireless signal with the above-mentioned receiving means indirectly through the above-mentioned repeater directly from the above-mentioned wireless transmitter in claim 3.

[Claim 5] Wireless communication system characterized by equipping the above-mentioned repeater with the frequency configuration switch which sets up the received frequency of the above-mentioned junction receiving means, or the transmit frequencies of the above-mentioned junction transmitting means in either of claims 1-3.